

DATA PROCESSING METHOD, DATA PROCESSING APPARATUS AND  
PORTABLE ELECTRONIC TERMINAL

CROSS REFERENCE TO RELATED APPLICATION

5           The present application is based on Japanese Priority Document 2001-021519 filed on January 30, 2001, the content of which is incorporated herein by reference.

BACKGROUND OF INVENTION

10   FIELD OF THE INVENTION

2001-021519  
The present invention relates to a data processing method, a data processing apparatus and a portable electronic terminal, especially relates to a ticketing method as the data processing method that are employed in stores, such as convenience stores, consigned for ticketing business from a ticket company and a sales data processing apparatus and portable electronic terminal used for the ticketing method of the present invention.

DISCUSSION OF THE BACKGROUND

20           Chain stores that practice sales business, expanding stores in various places, make good use of the POS (Point of Sales) apparatus, and thereby collectively grasp the sales situations of each of the stores to make up the total sales strategies.

25           Here, the POS system as mentioned above includes, for

example, multiple POS terminals that execute processing of various data, one store computer established in each of multiple stores that executes processing of the various data received from the multiple POS terminals, and a host  
5 computer established in the headquarters that executes processing of various data by receiving the various data from the store computers established in each of the multiple stores.

Now, the POS terminal of each store registers product  
10 sales data, etc., stores them sequentially, and sends the transaction data generated from the stored various data to the store computer of the same store after completing the registration processing. Then, the store computer of each store totalizes the transaction data received from the PCS  
15 terminals of the same store, and sends the totalized transaction data to the host computer of the headquarters, at a predetermined regulated timing, for example, once a day.

By utilizing the POS system as such, each store is  
20 able to confirm the sales situation, and the headquarters is able to confirm collectively the sales situations of the multiple stores.

Incidentally, in the convenience stores, etc., provided with this type of POS system, recently some stores  
25 practice the sales by reservation of various tickets, such

as concert tickets as one of the services. In such stores, ticket printers exclusive for ticketing are connected to the POS terminals, and the ticket printers print the tickets exclusively.

5           However, with the existing apparatus, a subscriber has to fill up an application form with his/her name, address, etc. when reserving a ticket, thus making the procedure troublesome.

10           On the other hand, a store clerk has to manually input the name, address, etc., written in the application form to the POS terminal. Such operation is a comparably time consuming work for convenience stores, and can easily become an obstacle to other operations (especially, sales settlement operation, etc.).

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#### SUMMARY OF THE INVENTION

20           The present invention has been made in view of these circumstances, and it is an object of the invention to achieve shortening of operation time, enhancement of work efficiency, and reduction of mistakes for the stores with provision of the sales data processing apparatus, and to improve serviceability for the customers.

25           The object of the present invention is achieved by the novel data processing method, a data processing apparatus and a portable electronic terminal of the present

invention.

According to a data processing method of the present invention, comprising the steps of:

executing a data communication by establishing an  
5 access between a data processing apparatus executing data processing with respect to an objective action and a portable electronic terminal storing necessary data for the data processing;

transmitting the data from the portable electronic  
10 terminal to the data processing apparatus when the data processing for the objective action is executed while the access between the data processing apparatus and the portable electronic terminal is established.

the data processing apparatus receiving the data from  
15 the portable electronic terminal when the data processing for the objective action is executed while the access between the data processing apparatus and the portable electronic terminal is established; and

the data processing apparatus executing the data  
20 processing with respect to the objective action by using the received data.

According to a data processing apparatus of the present invention, comprising:

means for executing a data communication by  
25 establishing an access from a portable electronic terminal

storing necessary data for data processing with respect to  
an objective action;

means for receiving the data from the portable  
electronic terminal through the means for executing the  
5 data communication when the data processing for the  
objective action is executed; and

means for executing the data processing with respect  
to the objective action by using the received data.

According to a portable electronic terminal of the  
10 present invention, comprising:

means for executing a data communication by  
establishing an access from a data processing apparatus  
executing data processing with respect to an objective  
action;

15 a data file storing necessary data for the data  
processing with respect to the objective action; and

means for transmitting the data through the means for  
executing the data communication when the data processing  
for the objective action is executed.

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#### BRIEF DESCRIPTION OF THE DRAWINGS

A more complete appreciation of the present invention  
and many of the attendant advantages thereof will be  
readily obtained as the same becomes better understood by  
25 reference to the following detailed description when

considered in connection with the accompanying drawings,  
wherein:

Fig. 1 is a schematic view, illustrating the POS  
system provided with POS terminals configuring the  
5 ticketing system relating to the embodiment of the  
invention;

Fig. 2 is an external perspective view of the POS  
terminal;

Fig. 3 is a block diagram illustrating the electrical  
10 connections between the units built in the POS terminal;

Fig. 4 is a block diagram illustrating the electrical  
connections between the units built in a cellular phone;

Fig. 5 is a schematic flow chart illustrating the  
ticketing processing;

15 Fig. 6 is an explanatory chart illustrating a data  
communication between the POS terminal and the cellular  
phone;

Fig. 7 (A) is a front view illustrating a state that  
a request to send customer data screen is displayed, as an  
20 example of a screen presented on a display of the cellular  
phone;

Fig. 7 (B) is a front view illustrating a state that  
a customer data confirmation screen is displayed, as an  
example of a screen presented on a display of the cellular  
25 phone;

Fig. 7 (C) is a front view illustrating a state that a customer data sending screen is displayed, as an example of a screen presented on a display of the cellular phone; and

5 Fig. 8 is a front view of the ticket that is printed out from a ticket printer.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The embodiment according to the present invention  
10 will be explained based on Fig. 1 through Fig. 8.

The ticketing system of the embodiment comprises a sales data processing apparatus as a data processing apparatus and a cellular phone as a portable electronic terminal. The ticketing system of the embodiment executes  
15 a data processing method of the present invention. Accordingly, the sales data processing apparatus operates as the data processing apparatus for executing data processing with respect to an objective action as ticket printing. The cellular phone as the portable electronic  
20 terminal stores necessary data for data processing with respect to the objective action as described following.

This embodiment will describes one example that applies the POS (Point of Sale) terminals used in stores such as convenience stores consigned for the ticketing  
25 operation of concert tickets, air tickets, travel tickets,



etc., by a ticket company to the sales data processing apparatus.

Fig. 1 illustrates a schematic drawing of a POS system A comprising POS terminals 1 that constitute the ticketing system of the embodiment. The POS system A comprises a store controller B, established in the back yard of a convenience store, plural POS terminals 1, established on cash registers of the same, and a ticket printer P for printing tickets connected to a specific POS terminal 1. The store controller B and the plural POS terminals 1 are connected to each other through a LAN (Local Area Network) cable L.

Since the technology is well known, a detailed explanation will be omitted except for the fact that the store controller B manages sales data from each POS terminal 1. Also, the store controller B is connected to a host computer of the headquarters, and the host computer of the headquarters manages data transmission to/from ticket companies, etc.

Now, Fig. 2 illustrates a schematic perspective of the POS terminal 1. As shown in Fig. 2, on the left side viewed from an operator of the POS terminal 1 enclosed in a body case 2, a thermal printer 3 (refer to Fig. 3) is provided, which is housed inside a printer cover 4. Further, on the printer cover 4, a receipt aperture 5 is



formed, from which receipts (not illustrated) printed by the thermal printer 3 are discharged.

Also, on the upper part of the printer cover 4, a bar code scanner 6 is mounted on a concave-formed scanner-placing unit 7, which optically reads product codes attached to the products. On the other hand, on the right side viewed from the operator of the POS terminal 1 are established a freely tiltable display 8 being an LCD (Liquid Crystal Display) that functions as a display device, a keyboard 9 on which various keys are assembled, a magnetic card insertion aperture 11 for inserting magnetic cards into a magnetic card reader 10 (refer to Fig. 3), and a mode key 12 that is operated and switched by a key not illustrated, etc.

Also, the display 8 has a touch panel 13 furnished thereon. The display 8 will exhibit the same function as the keyboard, by synchronizing the positional relation between the buttons, etc. displayed on the display 8 and the positional coordinates of the touch panel 13.

In addition, a customer side display 14 is provided on the back of the POS terminal 1, facing to a customer. The POS terminal 1 as such is mounted on a drawer 15 for use.

Next, the electric connection of the units built in the POS terminal 1 thus configured will be explained with reference to Fig. 3. As shown in Fig. 3, the POS terminal

1 incorporates a microcomputer 16, and the microcomputer 16  
drives and controls each of the units. The microcomputer  
16 includes a CPU (Central Processing Unit) 17 that  
controls each of the units intensively, to which are  
5 connected via a bus line 18 including address buses, data  
buses, etc., a ROM (Read Only Memory) 19 that stores fixed  
data such as startup programs in advance, a RAM (Random  
Access Memory) 20 that configures various buffers, such as  
sales buffer, print buffer, etc., and stores various data  
10 rewritably, and a timer 32 that clocks date and time. In  
addition, a VRAM (Video Random Access Memory) 31 which  
develops display data, etc. with high speed is connected to  
the bus line 18.

Also, to the bus line 18 connected to the CPU 17 is  
15 connected a HDD (Hard Disk Drive) 21, which is a storage  
medium; and, the HDD 21 stores a control program for  
operating the microcomputer 16, and other various data  
files. The various data files include, for example, a  
product master file, a sales master file, etc. Though not  
20 specifically illustrated, the product master file is  
provided with a file structure that stores and retains  
product names, unit prices, section codes, etc., in  
association with each of the product codes. The sales file  
is provided with a file structure that stores and retains  
25 the sales history of products such as sales details and

sales amounts.

The control program stored in the HDD 21 is written into the RAM 20 at start-up time of the POS terminal 1, along with the product master file, etc., thus enabling the microcomputer 16 to drive and control each of the units. Next, the units to be driven and controlled by the microcomputer 16 will be explained.

The keyboard 9 is connected to the bus line 18 via a keyboard controller 22, and inputs signals corresponding to operated keys to the microcomputer 16 through the operation of the keyboard controller 22.

The mode key 12 is connected to the bus line 18 via a mode key controller 23, and inputs signals corresponding to switched positions to the microcomputer 16 through the operation of the mode key controller 23. The microcomputer 16 sets the operation mode of the POS terminal 1 to each operation mode such as registration mode, setting mode, adjustment mode, and inspection mode, in accordance with an output signal from the mode key 12.

The display 8 is connected to the bus line 18 via a display controller 24, and when a display data is inputted to the display controller 24 from the microcomputer 16, the display 8, driven by the display controller 24, displays the specified items.

The customer side display 14 is connected to the bus

line 18 via a customer side display controller 25, and when  
a customer side display data is inputted to the customer  
side display controller 25 from the microcomputer 16, the  
customer side display 14, driven by the customer side  
5 display controller 25, displays the specified items.

The touch panel 13 is connected to the bus line 18  
via a panel controller 26, and through the operation of the  
panel controller 26, the touch panel 13 acquires a  
coordinate data in terms of the XY coordinate by  
10 recognizing a position on the panel touched by an operator,  
and outputs to the microcomputer 16 a signal corresponding  
to the acquired coordinate data. When the signal is  
inputted to the microcomputer 16, the microcomputer 16  
executes a specified processing based on this signal.

15 The bar code scanner 6 is connected to the bus line  
18 via a scanner controller 27, and transmits the read  
product code data to the microcomputer 16 through the  
operation of the scanner controller 27.

The magnetic card reader 10 is connected to the bus  
20 line 18 via a reader controller 28, and outputs information  
stored on a magnetic card to the microcomputer 16 through  
the operation of the reader controller 28.

Also, the thermal printer 3 built in the POS terminal  
1 is connected to the bus line 18 via a printer controller  
25 29, and is driven and controlled by the microcomputer 16.

Further, this thermal printer 3 has a cutter unit (not illustrated) built in, which is driven and controlled by the microcomputer 16. Thereby, the thermal printer 3 displays a function as a receipt printer, by printing out  
5 necessary items for a receipt on a long piece of receipt paper not illustrated, cutting and discharging the receipt from the receipt aperture 5.

Further, in the POS terminal 1, a plurality of communication I/Fs 30 that send and receive data by  
10 connecting the other POS terminals 1 and the store controller B, etc., via the LAN cable L are connected to the bus line 18, and are driven and controlled by the microcomputer 16. Also, the communication I/F 30 of a specific POS terminal 1 is connected to the ticket printer  
15 P, which permits the ticket printer P to print a ticket printing data outputted from the POS terminal 1 as a ticket.

The drawer unit 15 established separately from the POS terminal 1 is also driven and controlled by the microcomputer 16.

20 In addition, the POS terminal 1 is furnished with a radio communication means 33, which is connected to the bus line 18, and is driven and controlled by the microcomputer 16. This radio communication means 33 is, for example, the Bluetooth. The POS terminal 1 is able to send and receive  
25 data and programs to/from the other devices incorporating

the Bluetooth, by the control of the microcomputer 16.  
Here, an access between the devices incorporating the  
Bluetooth being established, a data communication means for  
executing data communication is implemented.

5       Next, a cellular phone 50 will be explained with  
reference to Fig. 4, which configures the ticketing system  
of this embodiment along with the POS system A. With  
regard to the appearance, etc., of the cellular phone 50  
relating to the embodiment, there is not any difference at  
10 all from the well-known, therefore the explanation thereof  
will be omitted. As shown in Fig. 4, the cellular phone 50  
is provided with microcomputer 51, and the microcomputer 51  
drives and controls each of the units such as a  
communication control unit 52, a display device 60, various  
15 keys 61, etc., which displays a telephone function. The  
microcomputer 51 includes a CPU 53 that controls each of  
the units intensively, to which are connected via a bus  
line 54 a ROM 55 that beforehand stores fixed data such as  
a control program to operate the microcomputer 51, and a  
20 RAM 56 that stores various data rewritably to function as a  
work area. In addition, the bus line 54 is connected to a  
VRAM (Video Random Access Memory) 57 which develops display  
data, etc. with high speed, and to a nonvolatile flash  
memory 58. The flash memory 58 holds an owner information  
25 file (data file) 59, which writes owner information (name,

address, phone number, etc.) for identifying owner as the data for data processing with respect to the objective action as ticket printing.

The control program stored in the ROM 55 is written into the RAM 56 at the startup time of the cellular phone 50, whereby the microcomputer 51 becomes able to drive and control each of the units. The units driven and controlled by the microcomputer 51 will be explained hereunder.

The various keys 61 is connected to the bus line 54 via a key controller 62, and inputs a signal corresponding to each operated key 61, through the operation of the key controller 62.

The display device 60 is connected to the bus line 54 via a display controller 63, and when a display data from the microcomputer 51 is inputted to the display controller 63, the display device 60, driven by the display controller 63, displays an image based on the display data.

Also, the cellular phone 50 is provided with a radio communication means 64. The radio communication means 64 is connected to the bus line 54 and is driven and controlled by the microcomputer 51. This radio communication means 64 is, for example, the Bluetooth. The cellular phone 50 is able to send and receive data and programs to/from the other devices incorporating the Bluetooth, by the control of the microcomputer 51. Here,



an access between the devices incorporating the Bluetooth being established, a data communication means or a data communication step for executing data communication is implemented.

5 Now, in the POS terminal 1 relating to the embodiment, when one access from one cellular phone 50 is established, the other accesses from the other cellular phones 50 are excluded. This is to prevent an incorrect data from being sent to the POS terminal 1, by establishing one-to-one data  
10 communication between the cellular phone 50 and the POS terminal 1. Further, in the POS terminal 1 relating to the embodiment, the accesses from the cellular phones 50 are limited to a given business menu operation time. This is to prevent fraudulent accesses from the cellular phones 50  
15 to POS terminal 1.

In this configuration, of the functions that the ticketing system relating to the embodiment exhibits, distinctive functions will be explained hereunder. Here, on the premise that the registration mode is set by the  
20 switching operation of the mode key 12 of the POS terminal 1, the ticketing process executed by the microcomputer 16 of the POS terminal 1 will be explained with reference to Fig. 5.

As shown in Fig. 5, the microcomputer 16 of the POS  
25 terminal 1 executes a ticketing processing when it detects

a key input by a ticketing key (not illustrated) on the keyboard 9 during the registration processing (Y at step S1). When it detects a key input of a product code from the keyboard 9 or the bar code scanner 6 (Y at step S2), it will execute the registration processing of the sales data of the product.

Next, the processing in the case where the key input from the ticketing key (Y at step S1) is detected will be explained. Here, when the key input from the ticketing key (Y at step S1) is detected, the display 8 of the POS terminal 1 displays a ticketing screen (not illustrated).

Then, a confirmation task for a requested ticket will be performed through the inquiry to the ticket company (step S3).

As a result, if the ticket is confirmed, information concerning seat numbers, etc. is sent online from the ticket company to the POS terminal 1 (Y at step S4). Then, the information is displayed on the ticketing screen of the display 8 of the POS terminal 1, and is developed as a ticket printing data in the specified area of the RAM (step S5).

Next, proceeding to step 6, the microcomputer 16 waits for the input of customer data that are personal information, such as name, address, phone number, etc. of the ticket purchaser. The input of the customer data can

be done in a traditional manner from the keyboard 9 or the touch panel 13. However, the ticketing system relating to the embodiment makes the input executable by the radio communication between the POS terminal 1 and the cellular  
5 phone 50.

As shown in Fig. 6, the POS terminal 1 and the cellular phone 50 are able to send and receive data or programs through the radio communication of the radio communication means 33 and the radio communication means 64  
10 that use the Bluetooth, for example. To be more precise, after the POS terminal 1 determines the cellular phone 50 owned by the ticket purchaser, it sends a program (for example, JAVA applet, etc.) to the concerned cellular phone 50, and displays a request to send customer data screen  
15 (request to send data screen) a on the display device 60 of the cellular phone 50 as illustrated in Fig. 7 (A) (sub-step S5). Here, a program transmission means or a program transmission step is executed. The request to send customer data screen a is for selecting whether to or not  
20 to authorize the transmission of the customer data.

As described above, when a ticket purchaser operates the cellular phone 50 on which the request to send customer data screen a is displayed on the display device 60, and the transmission of the customer data is authorized, a  
25 customer data confirmation screen b shown in Fig. 7 (B) is

displayed on the display device 60 of the cellular phone 50.  
On the customer data confirmation screen b, the customer  
data (address, name, phone number, etc.) that are personal  
information of the ticket purchaser are displayed. Here,  
5 the customer data displayed on the customer data  
confirmation screen b is stored in the owner information  
file 59. In other words, the ticket purchaser will be  
transmitting the customer data to the POS terminal 1 by  
means of the radio communication, through the operation of  
10 the cellular phone 50 with the request to send customer  
data screen a displayed on display device 60.

Further, when the customer data (address, name, phone  
number, etc.) is confirmed, it is transmitted to the POS  
terminal 1 from the cellular phone 50 through a key  
15 operation on the keys 61 of the cellular phone 50 by the  
ticket purchaser. After completion of the transmission, a  
customer data transmission screen c shown in Fig. 7 (C) is  
displayed on the display device 60 of the cellular phone 50.  
Here, the function of data transmission means or data  
20 transmission step is executed on the cellular phone 50.  
With the processing mentioned above, the transmission of  
the customer data to the POS terminal 1 from the cellular  
phone 50 is completed.

When the customer data is inputted (Y at step S6:  
25 data receiving means or data receiving step), it is

developed in a specified area in the RAM 20 as a ticket printing data (step 7).

Next, proceeding to step 8, the fee is calculated and displayed on the display 8, and on the customer side  
5 display 14.

Then, the microcomputer 16 of the POS terminal 1 generates a ticketing transaction data on the basis of the data having the ticketing processing completed as mentioned above, and temporarily stores the data in a buffer of the  
10 RAM 20 (step 9).

On the other hand, when a key input of a product code through the operation of the keyboard 9 or the bar code scanner 6 (Y at step S2) is detected, the unit price is read from the product master file in the RAM 20 based on  
15 the inputted product code, and the number of sales and amount of sales are stored accumulatively for each product code. Then, a registration processing, such as adding sales amount to the sales buffer in the RAM 20, is executed (step S10).

20 Next, the microcomputer 16 of the POS terminal 1 generates a transaction data with the sales data of the registration processed products, and stores the transaction data in a buffer of the RAM 20 (step 11).

Then, if the total key (not illustrated) on the  
25 keyboard 9 is operated (Y at step S12), the microcomputer

16 of the POS terminal 1 will execute the totaling processing of the ticketing data and product sales data having the registration processing repeated as desired.

Next, in the totaling processing of step 13, the total amount is calculated, which is displayed on the display 8 and on the customer side display 14, and, for example, a change is calculated, the drawer 15 is opened, and the thermal printer 3 prints various information on the receipt. Here, the function of objective execution means or objective execution step is executed on the POS terminal 1.

Also, in the ticketing processing of a ticket, the ticket printing data developed in a specified area in the RAM 20 is outputted to the ticket printer P from the POS terminal 1, and the ticket is printed out based on this ticket printing data. Here, Fig. 8 illustrates a front view of a ticket T printed by the ticket printer P. As shown in Fig. 8, the outputted ticket T has information X such as title, date, seat number, etc. along with a customer data (name of the ticket purchaser) Y printed on it.

Completing the registration processing as described above, the microcomputer 16 sends the transaction data composed of the product sales data stored in the buffer of the RAM 20 and the transaction data composed of the

ticketing data, to the store controller B through the communication I/F 30 (step S14).

Further, having received the transaction data, the store controller B determines whether the transaction data is a product sales data or a ticketing data by the identification code and the like. Then, the store controller B temporarily stores the transaction data composed of the product sales data in the RAM, etc., and transfers the transaction data composed of the ticketing data immediately to the host computer. Also, having received the transaction data composed of the ticketing data, the host computer immediately transfers the transaction data composed of the ticketing data to a host computer of the ticket company.

Here, sending a program for displaying the request to send data screen a to the cellular phone 50, the POS terminal 1 makes the cellular phone 50 display the request to send data screen a for authorizing the transmission of the owner information stored in the owner information file 59, thus allowing the owner to authorize the transmission of the owner information while referring to the request to send data screen a. On the other hand, the cellular phone 50 displays the request to send data screen a in accordance with the program sent from the POS terminal 1, and makes the owner authorize the transmission of the owner



information stored in the owner information file 59,  
whereby the owner information of which transmission has  
been authorized by the cellular phone 50 becomes possible  
to be sent to the POS terminal 1. Thus, the POS terminal 1  
5 is able to receive the owner information sent from the  
cellular phone 50. Thereby, it becomes possible to utilize  
the owner information such as addresses, etc. stored in the  
owner information file 59 as the customer information used  
for the ticketing business. Accordingly, it becomes  
10 possible to save the manual input of addresses, etc., at  
the POS terminal 1, by acquiring the customer information  
needed for the ticketing operation from the owner  
information stored in the owner information file 59 of the  
cellular phone 50, thus shortening the operation time,  
15 improving the work efficiency, reducing mistakes in the  
stores with the POS terminals 1, and improving the  
convenience and serviceability for the owners of cellular  
phones 50.

Further, in the embodiment, the ticketing operation  
20 processing has been used as an example for the explanation,  
but it is not limited to this. For example, it is also  
possible to acquire the names of clients in the reception  
operation of a home delivery service, from the owner  
information stored in the owner information file 59 of the  
25 cellular phone 50.

Also, in the embodiment, the cellular phone 50 is adopted as a portable electronic terminal, but it is not limited to this, and the so-called portable information terminal, such as a PC notebook, PDA (Personal Digital Assistants), PHS (Personal Handy-phone System) can also be adopted.

According to the invention, it is possible to make a portable electronic terminal display the request to send data screen for giving the authorization to transmit data stored in a data file, thus allowing the owner to refer to the request to send data screen and authorize the transmission of the data. On the other hand, when the data authorized as to the transmission in accordance with the request to send data screen is sent from the portable electronic terminal, the reception of the data by the product sales data processing apparatus makes it possible to save the manual input to this product sales data processing apparatus, concerning the data stored in the data file of the portable electronic terminal. Thereby, the stores with installation of the product sales data processing apparatus are able to shorten the operation time, to improve the work efficiency, and to reduce mistakes, and the customers who own the portable electronic terminals are able to enjoy enhanced convenience and serviceability.

Also, while the data communication means has been

establishing the access from one of the portable electronic terminals, the accesses from the other portable electronic terminals are excluded and not to be established, accordingly the portable electronic terminal and the product sales data processing apparatus are able to execute the communications of data in one-to-one relation, whereby the transmission of false data can be prevented to the product sales data processing apparatus.

Furthermore, limiting the accesses from the portable electronic terminals to a predetermined business menu operation time will make it possible to prevent a fraudulent access from a portable electronic terminal to the product sales data processing apparatus.

Obviously, numerous modifications and variations of the present invention are possible in light of the above teachings. It is therefore to be understood that within the scope of the appended claims, the invention may be practiced otherwise than as specifically described herein.